CLAIMS

What is claimed is:

1. A method for operating a wireless network comprised of end nodes and at least one intermediate node, comprising:

at an originating node of a session with a destination node, initiating a route search by sending a Route Request message;

at the destination node, or another node having knowledge of the destination node, replying to the originating node with a Route Reply message when there is a valid route, where route delay information relative to the responding node is contained within the Route Reply message; and

selecting a route with a smallest route delay to send a packet from the originating node to the destination node.

2. A method as in claim 1, where if either one of the originating node or the destination node detect a violation of path Quality of Service, further comprising initiating a re-route search.

3. A method as in claim 1, where if either one of the originating node or the destination node detect that the route delay exceeds a threshold route delay value, further comprising initiating a re-route search.

4. A method as in claim 1, where an intermediate node determines the route delay between itself and the destination node by:

receiving a probe message sent by the originating node to the destination node;

recording a time of arrival of the probe message;

forwarding the probe message towards the destination node;

receiving a response to the probe message from the destination node;

recording a time of arrival of the response to the probe message; and

calculating the round trip path delay between itself and the destination node by subtracting the recorded time of arrival of the probe message from the recorded time of arrival of the response to the probe message.

5. A method as in claim 4, further comprising storing the round trip path delay in at least a link table and a routing table of the intermediate node.

6. A method as in claim 4, further comprising:

periodically determining a received signal strength indication at the intermediate node; and

if the determined received signal strength indication is below a threshold value, adjusting the calculated round trip path delay value.

7. A method as in claim 5, further comprising:

periodically determining a received signal strength indication at the intermediate node; and

if the determined received signal strength indication is below a threshold value that indicates a degraded link, increasing the link delay and stored round trip path delay value in the node that detects that the signal strength is below the threshold value, and updating a routing table for all nodes that contain a route entry that comprise the degraded link.

8. A method as in claim 7, further comprising decreasing a link timeout value in the intermediate node in order to increase the speed of detection of a link break condition.

9. A method as in claim 8, further comprising, in response to detecting the link break condition, sending a Route Error message to the originating node to cause the originating node to trigger a re-route operation.

10. A method as in claim 1, where the network operates in accordance with an ad hoc routing protocol.

11. A method as in claim 1, where the network operates in accordance with an Ad Hoc On-Demand Distance Vector (AODV) routing protocol.

12. A wireless network comprised of end nodes and at least one intermediate node, comprising in said nodes programmed data processors for implementing a routing protocol, where for at an originating node of a session with a destination node, said data processor initiates a route search by sending a Route Request message; where in a destination node, or another node having knowledge of said destination node, a data processor replies to said originating node with a Route Reply message when there is a valid route, where route delay information relative to said responding node is contained within said Route Reply message; and where said data processor in said originating node selects a route with a smallest route delay to send a packet to said destination node.

13. A wireless network as in claim 12, where if either one of said originating node or said destination node detect a violation of path Quality of Service, the respective data processor initiates a re-route search.

14. A wireless network as in claim 12, where if either one of said originating node or said destination node detect that said route delay exceeds a threshold route delay value, the respective data processor initiates a re-route search.

15. A wireless network as in claim 12, where a data processor of an intermediate node determines said route delay between itself and said destination node by receiving a probe message sent by said originating node to said destination node; recording a time of arrival of said probe message; forwarding said probe message towards said destination node; receiving a response to said probe message from said destination node; recording a time of arrival of said response to said probe message; and calculating said round trip path delay between itself and said destination node by subtracting said recorded time of arrival of said probe message from said recorded time of arrival of said response to said probe message.

16. A wireless network as in claim 15, where said data processor of said intermediate node further stores said round trip path delay in at least a link table and a routing table of said intermediate node.

17. A wireless network as in claim 15, where said data processor of said intermediate node further periodically determines a received signal strength indication at said intermediate node and, if said determined received signal strength indication is below a threshold value, adjusts said calculated round trip path delay value.

18. A wireless network as in claim 16, where said data processor of said intermediate node further periodically determines a received signal strength indication at the intermediate node, and if the determined received signal strength indication is below a threshold value that indicates a degraded link, increases the link delay and stored round trip path delay value in the node that detects that the signal strength is below the threshold value, and thereafter initiates an update of the routing table for all nodes that contain a route entry that comprise the degraded link.

19. A wireless network as in claim 18, where said data processor of said intermediate node further decreases a link timeout value in said intermediate node in order to increase the speed of detection of a link break condition.

20. A wireless network as in claim 19, where said data processor of said intermediate node, in response to detecting said link break condition, sends a Route Error message to said originating node to cause said originating node to trigger a re-route operation.

21. A wireless network as in claim 12, where said network operates in accordance with an ad hoc routing protocol.

22. A wireless network as in claim 12, where said network operates in accordance with an Ad Hoc On-Demand Distance Vector (AODV) routing protocol.

23. A mobile node comprising a programmed data processor for causing said mobile node to function as an intermediate node between two end nodes in a wireless network, said data processor operable to determine a route delay between the mobile node and a first end node by receiving a probe message sent by a second end node to said first end node; said data processor being further operable for recording a time of arrival of said probe message; for forwarding said probe message towards said first end node; for receiving a response to said probe message from said first end node; for recording a time of arrival of said response to said probe message; and for calculating a path delay between itself and said first node by subtracting said recorded time of arrival of said probe message from said recorded time of arrival of said response to said probe message.

24. A mobile node as in claim 23, where said data processor further stores said calculated path delay in at least a link table and a routing table.

25. A mobile node as in claim 23, where said data processor further periodically determines a received signal strength indication and, if said determined received signal strength indication is below a threshold value, adjusts said calculated path delay value.

26. A mobile node as in claim 24, where said data processor further periodically determines a received signal strength indication at the intermediate node, and if the determined received signal strength indication is below a threshold value that indicates a degraded link, increases the link delay and stored round trip path delay value in the node that detects that the signal strength is below the threshold value, and thereafter initiates an update of the routing table for all nodes that contain a route entry that comprise the degraded link.

27. A mobile node as in claim 26, where said data processor further decreases a link timeout value in order to increase the speed of detection of a link break condition.

28. A mobile node as in claim 27, where said data processor, in response to detecting said link break condition, sends a Route Error message to said second node to initiate a re-route operation.

29. A mobile node as in claim 23, where said wireless network operates in accordance with an ad hoc routing protocol.

30. A mobile node as in claim 23, where said wireless network operates in accordance with an Ad Hoc On-Demand Distance Vector (AODV) routing protocol.